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Date of Signature
and Deposit: _____

Barry E. Sammons, Reg. No. 25,608

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Quinn H. Hogan
Serial No.: 10/731,273
Filed: December 9, 2003
Title: Transcutaneous Electrical Nerve Locator
Attorney. Docket: 650053.91673

**DECLARATION OF QUINN H. HOGAN
PURSUANT TO (37 CFR 1.132)**

Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Dear Sir:

This declaration is submitted to establish that the invention claimed in the above application is patentable over the cited prior art.

I, Quinn H. Hogan, declare and say that:

1. I am the inventor named in the above application and I reside at 1584 Cumberland Boulevard, Whitefish Bay, Wisconsin.

2. I received a B.S. from Stanford University in 1974, an M.D. from Harvard Medical School in 1978, and I am currently a professor of Anesthesiology at the Medical College of Wisconsin. My curriculum vitae is attached.

3. Regional anesthesia, in which only the site to be operated upon is anesthetized, is well recognized as safer than general anesthesia, in which medicines are administered that affect the body globally and alter circulation and breathing. Blocking nerves, however, requires the achievement of a certain degree of skill in order to be successful. Unlike general anesthesia, which only requires an intravenous line, regional anesthesia requires delivering local anesthetic drug to the target nerve, the location of which is not apparent through the skin and varies from subject to subject. As

a faculty member in anesthesia, I teach residents who must struggle through many failures, causing pain and risk to the patients. Further, I teach at national and international meetings, where experienced anesthesiologists still struggle with a high failure rate for these nerve block procedures. Especially for the general anesthesiologist in practice, who may not perform many blocks, but who must still be able to succeed in critical patients, a method to increase success and decrease risk is desperately needed. This means that a device that locates nerves through the skin without numerous painful and dangerous needle punctures must be developed.

4. Various efforts have failed to solve the problem. Anatomic studies fail to define the exact location of nerves because of variations in the size and shape of bodies and variation in the pattern of nerve branching and location relative to other body structures. Thus, one can not know where a nerve is on the basis of past experience or teaching. No form of imaging is available that shows the nerve in a practical way. Location of the nerve by touching it with a needle or stimulating it with currently available electrical stimulation methods requires the insertion of a needle. However, this necessitates the puncture of the skin with the needle in a place that can only be approximately determined, after which the nerve is sought with limited movement of the needle. Multiple such punctures are typically required to ultimately identify the nerve.

5. A standard feature of texts and meetings on regional anesthesia is how to find nerves for regional anesthesia blockade, acknowledging the continuing challenge of this technique. Three published studies evaluating the learning curve for regional anesthesia (1. Kopacz DJ, Neal JM, Pollock JE. The regional anesthesia "learning curve": what is the minimum number of epidural and spinal blocks to reach consistency? *Reg Anesth* 21: 182-90, 1996. (2. Konrad C, Schupfer G, Wietlisbach M, Gerber H. Learning manual skills in anesthesiology: is there a recommended number of cases for anesthetic procedure? *Anesth Analg* 86:635-9, 1998. and (3. Kestin IG. A statistical approach to measuring the competence of anaesthetic trainees at practical procedure. *Br J Anaesth* 75:805-809, 1995) show that blocks are learned very slowly and many practitioners never achieve a failure rate less than 20%.

6. Using my invention a target nerve can be located with sufficient accuracy that only one puncture of the skin is required. Specifically, by placing the electrode on the physician's finger and probing on the surface of the patient's skin, the range at which a nerve may be stimulated is consistently less than 1 cm wide. Since this range is less than the range that can be searched with a needle after its insertion beneath the skin, this insures that only one needle puncture is required.

7. Despite the long standing need for a solution to the problem of locating nerves for regional anesthesia, to my knowledge as a practicing physician and a professor in the field, there are no devices available for attachment to a physician's finger for the purpose of locating a nerve, and none have been described in publications in this field.

8. The Hadzic et al patent describes a well-established method and device that applies current to the region of a nerve through a needle. The current can only be applied after the needle punctures the skin, and "probing" for the target nerve can only be done after it is inserted through the skin. Thus a site of puncture must be chosen without benefit of knowing the location of the nerve. If the nerve is more than 1 cm away, the needle must be withdrawn and then reinserted at another location. Hadzic does not disclose any means of searching for the nerve prior to skin puncture, and offers no device to do to.

9. While the device described in the Brenman et al patent can be used to stimulate nerves, there is no suggestion that the glove device can be used in a procedure to locate and anesthetize a nerve. The disclosed device also has multiple electrodes at various locations on the glove making it unnecessarily expensive to manufacture.


10. The Berlant patent is not relevant. It has a single electrode covering the entire palm of the hand. With such a large surface area, a very large current would be required to produce a current density sufficient to stimulate a nerve. Also, the area of stimulation is too large to specifically locate a nerve. The Berlant device serves an entirely different purpose and is simply not relevant to the problem of locating a nerve.

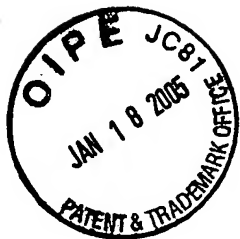
11. The Apple patent teaches that a protective device can be adhered to a user's finger tip. In this case the user is a sewer. Nothing in Apple suggests adhering an electrode to a user's finger tip and all of the other references employing an electrode show the electrode formed to a glove, not adhered to the user's finger.

12. My invention is an improvement over the method used in the Hadzic et al patent. My invention is an additional step of locating a nerve prior to needle insertion with such accuracy that the needle is in range of the nerve. The needle in Hadzic et al may then be energized to further assist in locating the depth of the nerve beneath the skin surface.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to me to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 1/6/05


Quinn H. Hogan



CURRICULUM VITAE

8/1/04

Quinn H. Hogan, M.D.

Professor of Anesthesiology

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Place of Birth: Madison, Wisconsin

Citizenship: U.S.A.

Education: 9/1970 – 6/1974 B.S., Stanford University,
Stanford, CA
9/1974 – 6/1978 M.D., Harvard Medical School,
Boston, MA

Postgraduate Training and Fellowship Appointments:

6/1978 – 6/1979	Internship, General Surgery Barnes Hospital, St. Louis, Missouri
6/1979 – 6/1980	Residency, Otorhinolaryngology Washington University, St. Louis, Missouri
1/1981 – 12/1982	Residency, Anesthesia Dept. of Anesthesiology, Harvard Medical School Brigham and Women's Hospital, Boston, Massachusetts

7/1989 – 6/1990	Fellow, Pain Clinic Department of Anesthesiology Medical College of Wisconsin Milwaukee, Wisconsin
11/2000 – 4/2001	Faculty Leadership Development Program Medical College of Wisconsin

Faculty Appointments:

7/1989 – 6/1990	Instructor Department of Anesthesiology Medical College of Wisconsin Milwaukee, WI.
7/1990 – 7/1994	Assistant Professor
7/1994 – 9/2001	Associate Professor
10/2001 – present	Professor
7/2002	Award of Tenure

Administrative Appointments:

9/1991 – 7/1993	Assistant Director, Pain Management Center, Froedtert Memorial Lutheran Hospital (FMLH) 9200 W. Wisconsin Ave., Milwaukee, WI 53226
7/1993 – 7/1997	Director, Pain Management Center, FMLH
11/1998 – 2/2001	Director, Pain Clinic Zablocki Veterans Hospital Milwaukee, WI
2/2001 – present	Co-Director, Pain Clinic Zablocki Veterans Hospital Milwaukee, WI
12/2002 – present	Director, Anesthesia Pain Research

Educational Administrative Positions:

6/1993 – 11/1998	Director, Fellowship in Pain Management Anesthesiology Department Medical College of Wisconsin
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Hospital Staff Privileges:

1/1983 – 6/1988	Odessa Medical Center, Odessa TX (Anesthesia private practice)
7/1988 – 6/1989	Baptist Medical Center, Louisville KY (Anesthesia private practice)
7/1989 – present	Froedtert Memorial Lutheran Hospital 9200 W. Wisconsin Ave., Milwaukee, WI 53226
7/1989 – present	Zablocki Veterans Hospital 5000 W National, Milwaukee, WI 53295

Specialty Boards and Certification:

<u>Board Certified</u>	<u>Issue Date</u>
American Board of Anesthesiology	1984
American Board of Anesthesiology Certificate of Added Qualifications in Pain Management	1994

<u>Certificates</u>	<u>Issued By</u>	<u>Issue Date</u>
ACLS	AHA	10/1998

<u>Licensure</u>	<u>Number</u>	<u>Issue Date</u>	<u>Expiration Date</u>
Wisconsin License	30575	7/26/1989	10/31/2005

Awards and Honors:

1970	National Merit Scholar
1973	Phi Beta Kappa
1992	Anesthesiology Department Teaching Award, Medical College of Wisconsin
2002	Innovations in Education Award, Education Affairs Committee, Medical College of Wisconsin

Memberships in Professional and Honorary Societies:

1981	American Society of Anesthesiologists
1982	American Society of Regional Anesthesia
1983	International Anesthesia Research Society
1990	Milwaukee Society of Anesthesiology
1990	Wisconsin Society of Anesthesiology
1997	Association of University Anesthesiologists

<u>Editorial Boards:</u>	1996-2003	<u>Anesthesiology</u> , Associate Editor
	1994-1997	<u>Regional Anesthesia and Pain Medicine</u> , Associate Editor
	1997-present	<u>Regional Anesthesia and Pain Medicine</u> , Senior Editor
Editorial Panel		<u>Anesthesia and Analgesia</u>

National Elected/Appointed Leadership and Committee Positions:

American Society of Regional Anesthesia:

1993-1996 Research Committee
1998-2002 Education Committee
1999-2002 Electronic Media Committee, Chair 1999
2004- Research Committee

American Society of Anesthesiology:

1994-1997 Scientific Paper Committee
1995-1996 Committee on Pain Management
1995-1997 Committee on Local Anesthesia and Pain

Research Grants, Contracts, Awards, Projects:**Peer Reviewed (most recent first)**

Title: Role of NPY Signaling in Neuropathic Pain
Source: NIH FIRCA
Role: Principal Investigator
Dates: pending
Direct Funds: \$96,000 (total direct)

Title: K_{ATP} Channels in Normal and Injured Sensory Transduction
Source: NIH K08 (to Constantine Sarantopoulos MD, PhD)
Role: Mentor
Dates: pending (resubmitted; scored at 23rd percentile)
Direct Funds: \$675,000 (total direct)

Title: Genetic Profiles for Perioperative Applications
Source: NIH SBIR Phase II to Third Wave Technologies Inc.
Role: Principal Investigator
Dates: June 1, 2004 – December 31, 2006
Direct Funds: \$77,866 (total direct)

Title: Traumatic Painful Neuropathy and Calcium Signaling
Source: NIH R01
Role: Principal Investigator
Dates: July 1, 2001 - June 30, 2005
Direct Funds: \$850,000 (total direct)

Title:	Treatment of the Dorsal Root Ganglion: The effects of Glucocorticoids
Source:	Foundation for Anesthesia Research and Education
(FAER)	
Role:	Director (Principal Investigator: Constantine Sarantopoulos MD, PhD)
Dates:	July 1, 2001 - June 30, 2003
Direct Funds:	\$35,000 first year, \$50,000 second year
Title:	Calcium Signaling in Sensory Neurons in Neuropathic Pain
Source:	MCW Research Affairs Grant
Role:	Principal Investigator
Dates:	July 1, 2000 - June 30, 2001
Direct Funds:	\$14,982
Title:	Computer Based Instruction in Regional Anesthesia: The Regional Anesthesia Instructional Disc (RAID)
Source:	MCW Curriculum and Education Committee Learning Resource Fund
Role:	Principal Investigator
Dates:	July 1, 2000 - June 30, 2001
Direct Funds:	\$9,800
Title:	Ligand Effects on Calcium Currents in Injured Sensory Neurons: Therapeutic Mechanism of Glucocorticoid, Local Anesthetic and Gabapentin
Source:	American Society of Regional Anesthesia, Braun Grant for Research Training in Pain
Role:	Director
Dates:	July 1, 1999 - June 30, 2000
Direct Funds:	\$40,000
Title:	Calcium Channel Changes in Dorsal Root Ganglion Cells of Rats with Neuropathic Pain
Source:	MCW Research Affairs Committee
Role:	Principal Investigator
Dates:	July 1, 1997 - June 30, 1998
Direct Funds:	\$40,000
Title:	Membrane Electrophysiologic Changes in Dorsal Root Ganglion Cells of Rats with Neuropathic Pain
Source:	American Society of Regional Anesthesia, Braun Grant for Research Training in Pain
Role:	Director
Dates:	July 1, 1996 - June 30, 1997
Direct Funds:	\$40,000

Title:	Definition of the Anatomic and Physical Features of the Spinal Column
Source:	American Society of Regional Anesthesia, Koller
Grant	
Role:	Principal Investigator
Dates:	July 1, 1993 - June 30, 1995
Direct Funds:	\$8,800
<u>Patent</u>	Transcutaneous Electrical Nerve Locator USPTO Application #10/731,273 (with MCW)

Invited Lectures/Workshops/Presentations/Site Visits:

International

National meeting of the American Veterans Association of Surgeons, "Post-operative analgesia and the stress response." Milwaukee, May 10, 1991

University of British Columbia Anaesthesia Highlights, "Epidural Space: New Perspectives." Vancouver, BC, Feb 27, 1994

Croatian World Congress of Anesthesiology, "New Developments in the Physiology of Pain: Implications for Therapy." Hvar, Croatia, September, 1996

World Foundation for Pain Relief and Research. "Role of Sympathetic Neural Blockade in Management of RSD (CRPS)." New York, December, 1997

Canadian Anaesthetists Society, Toronto, "Epidural Anatomy: It's not what you think." June, 1998

Visiting Professor, Innsbruck, Austria. "Epidural Anatomy," June 1998

Visiting Professor, Graz, Austria. "Scientific Writing and Publication"; "Spinal Anatomy," June 1998

Visiting Professor, Innsbruck, Austria February 22 - March 13 1999. "Circulatory Physiology and Resuscitation during Neural Blockade"

European Society of Anesthesia. "Diagnostic and Prognostic Neural Blockade." Amsterdam, May, 1999

Visiting Professor, Innsbruck, Austria. "Choice of Regional Anesthesia vs General Anesthesia." February 2000

Interdisciplinary Workshop in Anatomy of Regional Anesthesia, Graz Austria. "Spinal Anatomy"; "Anatomy of Sympathetic Blocks." March 2000

Visiting Professor, Dalhousie University Department of Anaesthesia, May 2000

Invited Speaker, University of Alberta Anesthesia Course, "Anatomy of Neuraxial Anesthesia," February 2001

European Academy of Anesthesia, Graz, Austria, "Animal Models for Pain Research," August 2001

British Ophthalmologic Anesthesia Society, Birmingham, England, Keynote Speaker, June 2002

European Society of Regional Anesthesia, Malta, Invited lectures: "Anatomy of combined spinal/epidural anesthesia" and "Animal models in pain research", September 2003

Visiting Professor, Department of Anesthesiology, University of Graz, Austria, September, 2004

Intensive Care Medicine Update, Graz, Austria, September, 2004. "Opioids in Intensive Care"

National

Visiting Professor, Hospital for Special Surgery, Cornell Medical School, NY, NY.

"Epidural Anatomy," December 12, 1992

American Society of Regional Anesthesia annual meeting, "New Anatomy of the Epidural Space." "New Anatomy of the Stellate Ganglion," Lecture and panel, Tampa, March 28, 1992

University of California San Diego Anesthesiology review course. "Local Anesthetics"; "Regional Anesthesia." May 26, 1993

American Society of Regional Anesthesia, "Sympathetic block, lumbar and cervical"; "What's new in epidural anatomy?" Seattle, May 13, 1993

American Society of Regional Anesthesia, "Sympathetic block, lumbar and cervical." Chicago, April 7, 1994

American Society of Regional Anesthesia Regional Meeting, "Anatomy, Head and Neck Blocks," Cincinnati, April 29, 1994

American College of Surgery, "Management of Chronic Cancer Pain: New analgesics and Principles of Pharmacokinetics." Chicago, October 13, 1994

American Society of Regional Anesthesia, "Sympathetic block, lumbar and cervical." Orlando, April 1, 1995

American Society of Regional Anesthesia Regional Meeting, "Regional Anesthesia for Thoracoabdominal Surgery," Milwaukee, June 17, 1995

American Pain Society Annual Meeting, "Epidural Steroids"; "Diagnosis of RSD" (lecture, panel Chair), Los Angeles, November 7, 1995

American Society of Regional Anesthesia, "Cardiovascular Response to Sympathetic Block by Regional Anesthesia"; "Local Anesthetic Toxicity," Orlando, June 1996

American Society of Regional Anesthesia, "Outcomes and Regional Anesthesia." Chicago, November, 1996

Symposium on Spinal Drug Delivery, "Anatomy of the Vertebral Column Relevant to Drug Delivery." San Diego, April 1997

American Society of Regional Anesthesia Refresher Course, "Anatomy and Physiology of the Sympathetic Nervous System." Hershey PA, September 1997

American Society of Regional Anesthesia, "Sympathetic block, lumbar and cervical"; "Local Anesthetic Myotoxicity." Seattle, May 14, 1998

Society of Toxicology satellite symposium on Safety Evaluation of Drugs for Central Nervous System Delivery, "Anatomic Issues," New Orleans, March 1999.

American Society of Regional Anesthesia, "Sympathetic block, lumbar and cervical"; "Resuscitation from Local Anesthetic Toxicity." Philadelphia, May, 1999

Ophthalmologic Anesthesia Society, "Myotoxicity of Local Anesthetics," Chicago, October 1999

Visiting Professor, Washington University of St. Louis Department of Anesthesiology, December 2000

Visiting Professor, Harvard Medical School, Brigham and Women's Hospital Department of Anesthesiology, March 2001

American Society of Regional Anesthesia, Course Director: Intensive Workshop on Brachial Plexus Block. Vancouver, April 2001

American Society of Regional Anesthesia, Invited Lecture: Myotoxicity. Symposium on Local Anesthetic Toxicity, Miami, November 2001
 Visiting Professor, University of New Mexico Medical School, Department of Anesthesiology, March 2002
 Keynote Speaker, 6th Annual Hospital for Special Surgery Regional Anesthesia Meeting, New York, April 2002
 American Society of Regional Anesthesia and Pain Medicine annual meeting, March 2004, "Anatomy of Regional Anesthesia" and "Anatomy of Brachial Plexus Blockade"
 Kansas City Anesthesia Society, March 2004. "What the Anesthesiologist needs to know about Anatomy"

Regional

Medtronic Neurological Forum, "Epidural Anatomy and Dorsal Column Stimulation." Minneapolis, Minn. November. 23, 1991
 Illinois State Society of Anesthesiology, "Epidurals for Cancer Pain." Lecture and panel, Chicago, November 8, 1992
 Missouri State Society of Anesthesiology, "Epidurals for Cancer Pain". Lecture and panel, Jefferson City, MO, April 1993
 Missouri State Society of Anesthesiology, "What do blocks tell us about pain". Lecture and panel, Jefferson City, MO, April 1993
 ASRA Regional Meeting, "Regional Anesthesia for Thoracoabdominal Surgery," Chicago, August 6, 1994
 Wisconsin Society of Anesthesiology Annual Meeting, "What's New in Pain Management." 1995
 Wisconsin Society of Anesthesiology Annual Meeting, "Issues in Anatomy." 1995
 Am. Society Regional Anesthesia, "Brachial Plexus Blockade", "Thoracic Epidural Blockade," Milwaukee, September, 1999
 Wisconsin Society of Anesthesiology. "Physiology of Regional Anesthesia." October 2000
 Medtronic Neurologic Seminar Series. "Dynamics of the Intrathecal /Epidural Spaces" March, 2001

Medical College of Wisconsin Committees:

1992	Dean's Task Force on Physical Medicine and Rehabilitation
1993-1997	Anesthesiology Executive Committee
1993-1995	MCW Faculty Risk Advisory Panel
1993-1998	Anesthesia Department Clinical Competence Committee
2000 – present	Anesthesia Research Committee
8/2001 – 3/2004	MCW Faculty Library Committee
2/2002 – 9/2002	Faculty Council
2002	Dean's Committee on Interdisciplinary Pain Clinic (Chair)
2002 – present	Departmental Compensation Committee
8/2003 – present	MCW Rank and Tenure Committee

Medical College of Wisconsin Teaching Activities:

Medical Student Education

1997-1999 Lecturer, Neurosciences Course
 1989-present Departmental student lecture series

Resident & Fellow Education

1991-1998 Anesthesiology Department Pain Clinic
 Weekly Lecture Series Coordinator and Principal
 Lecturer
 1991-present Resident Core Lecture series Regional Anesthesia and
 Pain Block Coordinator and Lecturer
 1991-present Resident Introductory Lecture Series
 1994-present Annual fall weekend anatomy workshop

Faculty Development/Continuing Medical Education

Faculty at MCW Anesthesia Department Annual Meeting, Update on
 Regional Anesthesia. Copper Mountain, Colorado, Feb. 8, 1994

MCW Students, Faculty, Residents or Fellows Mentored:

1990 – present	Pain Management Fellow supervision (total of 20 fellows)
6/1995 – 7/1996	Alexander Kulier, MD, postdoctoral fellow, research
1/1996 – present	J Bruce McCallum PhD, research scientist
7/1996 – 6/1997	Mark Aason MD, postdoctoral fellow, research
1/1997 – 1/1999	John Amuzu MD, Assistant Professor
10/1999 – 3/2000	Shinji Kohro, MD, postdoctoral fellow, research
6/2000 – 3/2001	Akifumi Kanae MD, postdoctoral fellow, research
1/1999 – present	Constantine Sarantopoulos MD, PhD, postdoctoral fellow, research; subsequently Assistant Professor
3/2000 – 8/2002	Yuri Nakae MD, postdoctoral fellow, research
5/2001 – 2/2003	Damir Sapunar MD, postdoctoral fellow, research; currently Assoc. Prof. Dept. of Anatomy, Univ. of Split, Croatia
7/2003 – 9/2004	Philipp Lirk, MD, postdoctoral fellow, research; currently Dept. of Anesth. University of Innsbruck, Austria
1/2004 – present	Andreas Fuchs, MD, postdoctoral fellow, research
7/2004 – present	Chun-Yuan Huang, PhD, postdoctoral fellow, research
6/2004 – 8/2004	Johnny Yi, MS2, summer research

Dissertation Committees

4/2003

Constantine Sarantopoulos, Masters,
Pharmacology

4/2004

Nicole Breese, Masters, Cell Biology

BIBLIOGRAPHY

Refereed Journal Publications/Original Papers

1. **Hogan Q**, Haddox JD, Abram S, Weissman D, Taylor ML, Janjan N. Epidural opiates and local anesthetics for the management of cancer pain. Pain 46: 1991.
2. **Hogan Q**. Lumbar epidural anatomy: a new look by cryomicrotome section. Anesthesiology 75:767-775, 1991.
3. **Hogan Q**, Erickson S. MR imaging of the stellate ganglion: Normal appearance. Am J Roentgen 158:655-659, 1992.
4. **Hogan Q**, Erickson S, Haddox JD, Abram S. The spread of solutions during "stellate ganglion" blockade. Reg Anesth 17:78-83, 1992.
5. **Hogan Q**, Haddox JD. Headache from intracranial air after a lumbar epidural injection: subarachnoid or subdural? Reg Anesth 17: 303-305, 1992.
6. **Hogan Q**, Erickson SJ, Abram S. Computerized tomography (CT) guided stellate ganglion blockade. Anesthesiology 77:596-599, 1992.
7. Erickson SJ, **Hogan Q**. CT guided stellate ganglion injection: description of technique and efficacy of sympathetic blockade. Radiology 188:707-709, 1993.
8. **Hogan QH**, Stadnicka A, Stekiel TA, Bosnjak ZJ, Kampine JP. Effects of epidural and systemic lidocaine on sympathetic activity and mesenteric circulation in rabbits. Anesthesiology 79:1250-1260, 1993.
9. **Hogan Q**, Taylor ML, Goldstein M, Stevens R, Kettler R. Success rates in producing sympathetic blockade by paratracheal injection. Clin J Pain 10:139-145, 1994
10. **Hogan Q**, Stadnicka A, Kampine JP. Effects of epidural anesthesia on splanchnic capacitance. Adv Pharmacol 31: 471-483, 1994.
11. **Hogan Q**, Dotson R, Erickson S, Kettler R, Hogan K: Local anesthetic myotoxicity: a case and review. Anesthesiology 80:942-947, 1994
12. **Hogan QH**, Stadnicka A, Stekiel TA, Bosnjak ZJ, Kampine JP. Mechanism of mesenteric venodilatation during epidural anesthesia in rabbits. Anesthesiology 81:939-945, 1994

13. Stadnicka A, Stekiel T, **Hogan Q**, Bosnjak Z, Kampine JP: Hypoxic contraction of isolated rabbit mesenteric veins: contribution of endothelium and attenuation by volatile anesthetics. Anesthesiology 82:550-558, 1995.
14. **Hogan QH**, Stadnicka A, Stekiel TA, Bosnjak ZJ, Kampine JP. Region of epidural blockade determines sympathetic and mesenteric capacitance effects in rabbits. Anesthesiology 83:604-610, 1995
15. **Hogan QH**, Prost R, Kulier A, Taylor ML, Liu S, Mark L. Magnetic resonance imaging of cerebrospinal fluid volume and the influence of body habitus and abdominal pressure. Anesthesiology 84:1341-9, 1996
16. **Hogan QH**. Epidural anatomy examined by cryomicrotome section: influence of age, level and disease. Reg Anesth 21:395-406, 1996.
17. **Hogan QH**. Cardiovascular response to sympathetic blockade by regional anesthesia. Reg Anesth 21S: 26-34, 1996.
18. **Hogan QH**. Local anesthetic toxicity: an update. Reg Anesth 21S:43-50 1996.
19. **Hogan QH**. Size of human lower thoracic and lumbosacral nerve roots. Anesthesiology 85:37-42, 1996.
20. Kulier A, Woehlick HJ, **Hogan QH**, Hoffmann RG, Novalija E, Turner LA, Bosnjak ZJ. Epinephrine dysrhythmogenicity is not enhanced by subtoxic bupivacaine in dogs. Anesth Analg 83:62-7, 1996
21. **Hogan QH**, Kulier A, Bosnjak ZJ, Kampine JP. Sympathetic and mesenteric venous responses to baroreceptor or chemoreceptor stimulation during epidural anesthesia in rabbits. Anesthesiology 85: 1413-1421, 1996
22. Fouch RA, Abram SE, **Hogan QH**. Neural blockade for upper extremity pain. Hand Clinics 12: 791-800, 1996
23. **Hogan Q**, Abram S. Neural blockade for diagnosis and prognosis: a review. Anesthesiology 86:216-241, 1997
24. Amuzu J, Baig H, Tam H, Patel S, **Hogan Q**, Maitra-D'cruze A. Perinatal anesthetic considerations in a patient with Eisenmenger's syndrome. Am J Anesth 24:311-314, 1997
25. **Hogan QH**, Novalija E, Kulier AH, Turner LA, Bosnjak ZJ. Effect of thoracic epidural anesthesia on spontaneous postinfarction ventricular dysrhythmia in dogs. Reg Anesth 22:318-324, 1997
26. **Hogan Q**, Amuzu J, Clifford P, Bosnjak Z, Kampine JP. Hypoxia causes apnea during epidural anesthesia in rabbits. Anesthesiology 88:761-7, 1998

27. Carpenter RL, Liu S, **Hogan Q**, Crane B. Lumbosacral CSF volume is the primary determinate of sensory block height and duration of spinal anesthesia. Anesthesiology 89:24-9, 1998
28. **Hogan QH**. Epidural anatomy: New observations. Can J Anaesth 45:R40-48, 1998
29. Novalija E, **Hogan QH**, Kulier AH, Turner LH, Bosnjak ZJ. Effects of desflurane, sevoflurane and halothane on post-infarction spontaneous dysrhythmias in dogs. Acta Anesthesiologica Scand 42:353-7, 1998
30. McCallum JB, Boban N, **Hogan Q**, Schmeling WT, Kampine JP, Bosnjak ZJ. The mechanism of alpha-2 adrenergic inhibition of sympathetic ganglion transmission. Anesth Analg 87:503-10, 1998
31. **Hogan Q**, Stadnicka A, Bosnjak Z, Kampine JP: Effects of lidocaine and bupivacaine on isolated rabbit mesenteric veins. Reg Anesth and Pain Med 23:409-17, 1998
32. **Hogan, Q**. Anatomy of spinal anesthesia: some old and new findings. Reg Anesth and Pain Med 23:340-43, 1998
33. **Hogan, Q**. Epidural catheter tip position and distribution of injectate evaluated by computerized tomography. Anesthesiology 90:964-70, 1999
34. **Hogan, Q**, Toth, J. Anatomy of soft tissues of the spinal canal. Reg Anesth and Pain Med 24:303-10, 1999
35. Kulier AH, Novalija E, **Hogan Q**, Vicenzi MN, Woehlck HJ, Bajic J, Atlee JL, Bosnjak ZJ. The effects of the new antiarrhythmic E 047/1 on postoperative ischemia-induced arrhythmias in dogs. Anesthesia and Analgesia 89:1393-9, 1999
36. Fassoulaki A, Sarantopoulos C, Melemenis A, **Hogan Q**. EMLA reduces acute and chronic pain after breast surgery for cancer. Reg Anesth and Pain Med 25:350-5, 2000
37. **Hogan QH**, McCallum JB, Sarantopoulos C, Aason M, Mynlieff M, Kwok W-M, Bosnjak ZJ. Painful neuropathy decreases membrane calcium current in mammalian primary afferent neurons. Pain 86:43-53, 2000
38. Fassoulaki A, Sarantopoulos C, Melemenis A, **Hogan Q**. Regional block and mexiletine: the effect on pain after cancer breast surgery. Reg Anesth Pain Med 26:223-228, 2001
39. Krismer AC, **Hogan QH**, Wenzel V, Lindner, KH, Achleitner U, Oroszy S, Rainer B, Wihaidi A, Mayr VD, Spencker P, Amann A. The efficacy of epinephrine or vasopressin for resuscitation during epidural anesthesia. Anesth Analg 93:734-42, 2001
40. Kohro S, **Hogan QH**, Nakae Y, Yamakage M, Bosnjak ZJ. Anesthetic effects on mitochondrial ATP-sensitive K channel. Anesthesiology 95:1435-1440, 2001

41. **Hogan QH.** Distribution of solution in the epidural space: examination by cryomicrotome section. Regional Anesthesia and Pain Medicine 27:150-156, 2002
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